BAR CODE MEDICATION ADMINISTRATION (BCMA)

TECHNICAL MANUAL/SECURITY GUIDE

Version 2.0
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(Revised March 2003)

Department of Veterans Affairs
V*IST***A** System Design & Development

Revision History

The table below lists changes made since the initial release of this manual. Use the Change Pages document to update an existing manual, or use the entire updated manual.

Note: The Change Pages document may include unedited pages needed for two-sided copying. Only edited pages display the patch number and revision date in the page footer.

Date	Revised Pages	Patch Number	Description
03/03	Title Page, i, iii, 9, 11, 19, 27	PSB*2*20	– Updated the Title Page and this Revision History Page. (p. i) – Updated the Table of Contents to include the new site parameter, "Patient Transfer Notification Timeframe." (p. iii) – Updated the Parameters Tab bulleted list and the "BCMA Site Parameters Main Screen with Parameters Tab Selected" example to include the new site parameter, "Patient Transfer Notification Timeframe" under the Misc Options area. The example also reflects the removal of the "General System Error" and "Auto Update Notification" site parameters under the Mail Groups area, and the "UNC of Auto Update Server" site parameter under the Misc Options area. (p. 9) – Added an explanation about the new site parameter, "Patient Transfer Notification Timeframe." (p. 11) – In the first paragraph, changed the number of Mail Groups from four to two, and removed the phrase "Auto Update changes to PCs." Also, removed the "General System Error" and "Auto Update Notification" information from the section "Mail Group Types in BCMA V. 2.0" since these site parameters were removed from the Parameters Tab of the GUI BCMA Site Parameters application. (p. 19) – In the Glossary, added the definition for Patient Transfer Notification, and updated the PSB STUDENT definition to specify that a "nursing instructor," not just a nurse, must sign on for a nursing student to access BCMA V. 2.0. (p. 27)
02/03	Title Page, i, 6, 7	PSB*2*8	– Updated the Title Page and this page. – Updated the Intranet address for the VistA Documentation Library (VDL). – Increased the total number of routines for BCMA V. 2.0 to equal 52. – Changed the "BCMA V. 2.0 Routines Installed on to **V*IST*A** Server" example to reflect the inclusion of routine PSBRPC3 to the **V*IST*A** Server.
02/03	Title Page, i, iv, 29-32	PSB*2*6	– Updated the Title Page, the Table of Contents, and this page. – Added Appendix A to this guide, which describes how BCMA V. 2.0 processes schedule information from Inpatient Medications V. 5.0.
08/02	Title Page, i, 6, 7	PSB*2*1	– Updated the Title Page and included this Revision History Page. – Renumbered the pages with Roman numerals to include this page. – Decreased the total number of routines for BCMA V. 2.0 to equal 51. – Changed the "BCMA V. 2.0 Routines Installed on to **V*IST*A** Server" example to reflect the deletion of routine PSB0000 from the **V*IST*A** Server.
05/02			Original Released Technical Manual/Security Guide

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BCMA V. 2.0 and This Guide

Benefits of BCMA V. 2.0

TIP:

BCMA is designed to augment, not replace, the clinical judgment of the medication administrator, or clinician.

The Bar Code Medication Administration (BCMA) V. 2.0 software is designed to improve the accuracy of the medication administration process, and to increase the efficiency of the administration documentation process. By automating this process, Veterans Affairs (VA) medical centers can expect enhanced patient safety and patient care.

As each patient wristband and medication is scanned with a bar code reader, BCMA V. 2.0 validates that the medication is ordered, timely, and in the correct dosage — as well as electronically update the patient's Medication Administration History (MAH) Report.

The electronic information that BCMA V. 2.0 provides clinicians improves their ability to administer medications safely and effectively to patients on wards during their Med Passes. Not only does BCMA V. 2.0 improve the accuracy of the medication administration process, but also the daily communication that occurs between Nursing and Pharmacy staffs.

Benefits of This Guide

This guide will help you discover the many technical and security aspects of BCMA V. 2.0. It describes implementation and maintenance features; interfaces, variables, and relationships; and security management.

Our Target Audience

We have developed this guide for members of the Automated Data Processing (ADP) group and the Information Resources Management (IRM) group who are responsible for maintaining and supporting this package.

We assume that individuals within these groups have the following experience or skills.

- Experienced with other Veterans Health Information Systems and Technology Architecture (**V***IST***A**) software
- Have worked with or will work with an Applications Package Coordinator (ADPAC) or Clinical Applications Coordinator (CAC) familiar with the medication administration process in a Veterans Affairs Medical Center (VAMC)

BCMA V. 2.0 and This Guide

Other Sources of Information

TIP:

Bookmark these sites for future reference.

Refer to the Web sites listed below when you want to receive more background and technical information about BCMA V. 2.0.

Background/Technical Information

From your Intranet, enter http://vista.med.va.gov/bcma in the Address field to access the BCMA Main Web page.

This Manual and Related Documentation

From your Intranet, enter http://www.va.gov/vdl in the Address field to access this manual, and other BCMA V. 2.0 documentation listed below, from the **V*IST*A** Documentation Library (VDL).

- Installation Guide
- Release Notes
- GUI User Manual
- Nursing CHUI User Manual
- Pharmacy CHUI User Manual
- Manager's User Manual

Conventions Used in This Guide

TIP:

In a CHUI environment, when you press **ENTER**, instead of typing a response, the system accepts the default value shown to the left of the double slash (//) at a prompt or a field.

Before installing BCMA V. 2.0, review this section to learn the many conventions used throughout this guide.

- **Keyboard Responses:** Keys provided in **boldface**, within the copy, help you quickly identify what to press on your keyboard to perform an action. For example, when you see **ENTER** in the copy, press this key on your keyboard.
- **Mouse Responses:** Buttons provided in **boldface**, within the steps, indicate what you should click on your computer screen using the mouse. For example, when you see **NEXT, YES/NO,** or **OK** in the steps, click the appropriate button on your screen.
- **Screen Captures:** Provide "shaded" examples of what you will see on your computer screen, and possible user responses.
- **Notes:** Provided within the steps, describe exceptions or special cases about the information presented. They reflect the experience of our Staff, Developers, and Testers.
- **Tips:** Located in the left margin, these helpful hints are designed to help you work more efficiently with BCMA V. 2.0.
- **Menu Options:** Provided in italics. For example, You may establish Electronic Signatures Codes using the Kernel *Electronic Signature code Edit* [XUSESIG] option.

BCMA V. 2.0 and This Guide

Obtaining On-line Help

On-line help is designed right into the Graphical User Interface (GUI) and Character-based User Interface (CHUI) versions of BCMA V. 2.0, making it quick and easy for you to get answers to your questions. Here's how to access help in both versions of BCMA V. 2.0:

- **GUI BCMA:** Provides context-sensitive, on-line help and the Help menu.
  - **Context-Sensitive Help:** Place your "focus" on a feature, button, or Tab on the BCMA Virtual Due List (VDL) using the **TAB** key, and then press **F1** to receive help specific to that area of the VDL. In the case of a command, first highlight it in the Menu Bar or Right Click drop-down menu, and then press **F1.**
  - **Help Menu:** Open the Help menu, and then choose the Contents and Index command to receive help for every feature in GUI BCMA V. 2.0.
- **CHUI BCMA:** Lets you enter up to two question marks at any prompt to receive on-line help.
  - **One Question Mark:** Provides a brief statement related to the prompt.
  - **Two Question Marks:** Displays more detailed information about the prompt, plus any hidden actions.

Locating Detailed Listings

You can obtain *and* print listings about BCMA V. 2.0 routines, and Data Dictionaries using the information provided below.

Routines

Use the Kernel routine XINDEX to produce detailed listings of routines. Use the Kernel *XU First Line Print* (First Line Routine Print) option to print a list containing the first line of every PSB routine.

Data Dictionaries

The Data Dictionaries (DDs) are included in the on-line documentation for this software application. You can use the VA FileMan *List File Attributes* [DILIST] option, under the *Data Dictionary Utilities* [DI DDU] option, to print the Dictionaries.

Minimum Required Packages

TIP:

BCMA V. 2.0 requires a Master Build.

Before installing BCMA V. 2.0, make sure that your system includes the following Department of Veterans Affairs (VA) software packages and versions (those listed or higher).

The software listed is *not* included in the Master Build and must be installed for the Build to be completely functional.

Note: The Master Build provides all of the routines and patches necessary for installing BCMA V. 2.0. Patches required for other software packages are listed in the "Required Patches" section, and BCMA V. 2.0 routines are listed in the "Routines Installed" section of this guide.

Example: Minimum Required Packages and Versions

PACKAGE	MINIMUM VERSION NEEDED
Inpatient Medications	5.0
Kernel	8.0
MailMan	7.1
Nursing	4.0
Order Entry/Results Reporting	3.0
Pharmacy Data Management	1.0
RPC Broker (32-bit)	1.1
Toolkit	7.3
VA FileMan	22.0

Implementation and Maintenance

Required Patches

Before installing the BCMA V. 2.0 Master Build, make sure that the following released patches are installed.

Pharmacy Data Management V. 1.0

PSS*1*46 – requires the following patch

- PSS*1*44

Inpatient Medications V. 5.0

PSJ*5*58 – requires the following patches

- PSJ*5*24
- PSJ*5*62
- PSS*1*46 – will be installed as part of the BCMA V. 2.0 Master Build
- PSJ*5*68
- PSJ*5*69
- PSJ*5*71
- PSJ*5*75

CPRS V. 1.0

OR*3*133

RPC Broker V. 1.1

XWB*1.1*26

XWB*1.1*29

Installation Time Estimates

On average, it takes approximately one minute to install BCMA V. 2.0. This estimate was provided by one of our BCMA V. 2.0 Beta Test sites. Suggested time to install: non-peak requirement hours. PC Client users should not be accessing the Client Software.

Note: Actual times may vary, depending on how your site is using its' system resources.

Resource Requirements

TIP:

The approximate size for ^PSB was calculated using a "normal" Med Pass for a Unit Dose and an IV medication order. This is only an estimated number; it serves as the "mean."

This section summarizes the (approximate) number of resources required to install BCMA V. 2.0.

- Routines 52
- Globals 1 (^PSB)
- Files 5 (53.66-53.79)
- ^PSB Size (in bytes) Unit Dose = 300 x # of Medications Administered
  IV = 2100 x # of IV Bags Administered
- FTEE Support .2
- FTEE Maintenance .2

Response Time Monitor

BCMA V. 2.0 does *not* include Response Time Monitor hooks.

Laptops and Bar Code Scanners

The approximate requirements for laptops and bar code scanners depend on the number of Inpatient areas, at your site, that use BCMA for administering active medication orders. The BCMA Development Team recommends that your site have a minimum of three laptops and three scanners for each ward.

Printers

Your site should provide printers for creating patient wristbands and medication bar code labels, and for handling Missing Dose Requests sent from BCMA V. 2.0 to the Pharmacy.

Unit Dose Label Printer Devices

BCMA V. 2.0 includes the *Label print* [PSBO BL] option for printing individual or batch Unit Dose bar code labels. It is specifically coded to the Zebra-brand printers using ZPL command language. Model 105SE was used in the development of the labels. Routine PSBO BL uses site-specific printers or terminals to produce labels.

IV Label Printer Devices

Inpatient Medications V. 5.0 provides an option for printing individual or batch IV bar code labels. See the section "Interfacing with the Bar Code Label Printer" in the *Inpatient Medications V. 5.0 Technical Manual/Security Guide* for detailed setup information.

Implementation and Maintenance

Files Required to Run BCMA V. 2.0

TIP:

The namespace for the BCMA package is PSB and the primary global is ^PSB.

BCMA V. 2.0 uses the following files installed on the V*IST*A Server. "Journaling" is recommended.

- ^PSB (53.66, BCMA IV Parameters
- ^PSB (53.68, BCMA Missing Dose Request
- ^PSB (53.69, BCMA Report Request
- ^PSB (53.78, BCMA Medication Variance Log
- ^PSB (53.79, BCMA Medication Log

Note: You can learn more about these files by generating a list with file attributes using VA FileMan.

Routines Installed

Review the listing below to learn the routines installed on to your site's V*IST*A Server during the installation of BCMA V. 2.0. The first line of each routine briefly describes its general function.

Note: You can use the Kernel *XU First Line Print* (First Line Routine Print) option to print a list containing the first line of each PSB routine.

Routine Mapping

At this time, we do *not* offer any recommendations for routine mapping. However, if you choose to map the BCMA V. 2.0 package routines, you will need to bring your system down, and then restart it to load the new routines into memory.

Example: BCMA V. 2.0 Routines Installed on to V*IST*A Server

```
PSBALL    PSBAPIPM  PSBMD     PSBML     PSBML1    PSBMLEN   PSBMLEN1  PSBMLHS
PSBMLTS   PSBMLU    PSBMLVAL  PSBO      PSBO1     PSBOAL    PSBOBL    PSBODL
PSBODL1   PSBODO    PSBOHDR   PSBOMD    PSBOMH    PSBOMH1   PSBOMH2   PSBOML
PSBOMM    PSBOMV    PSBOPE    PSBOPI    PSBOPM    PSBOWA    PSBPAR    PSBPARIV
PSBPOIV   PSBPRN    PSBRPC    PSBRPC1   PSBRPC2   PSBRPC3   PSBRPCMO  PSBRPCXM
PSBSAGG   PSBUTL    PSBVAR    PSBVDLIV  PSBVDLPA  PSBVDLPB  PSBVDLTB  PSBVDLU1
PSBVDLU2  PSBVDLUD  PSBVDLVL  PSBVT
```

Items Deleted During the Install Process

This section lists the items deleted during the installation of BCMA V. 2.0.

- Files None
- Options None
- Routines PSBVDL, PSBVDL1, PSBVDL2, PSBORL
- Templates None

New Site Parameters in BCMA V. 2.0

TIP:

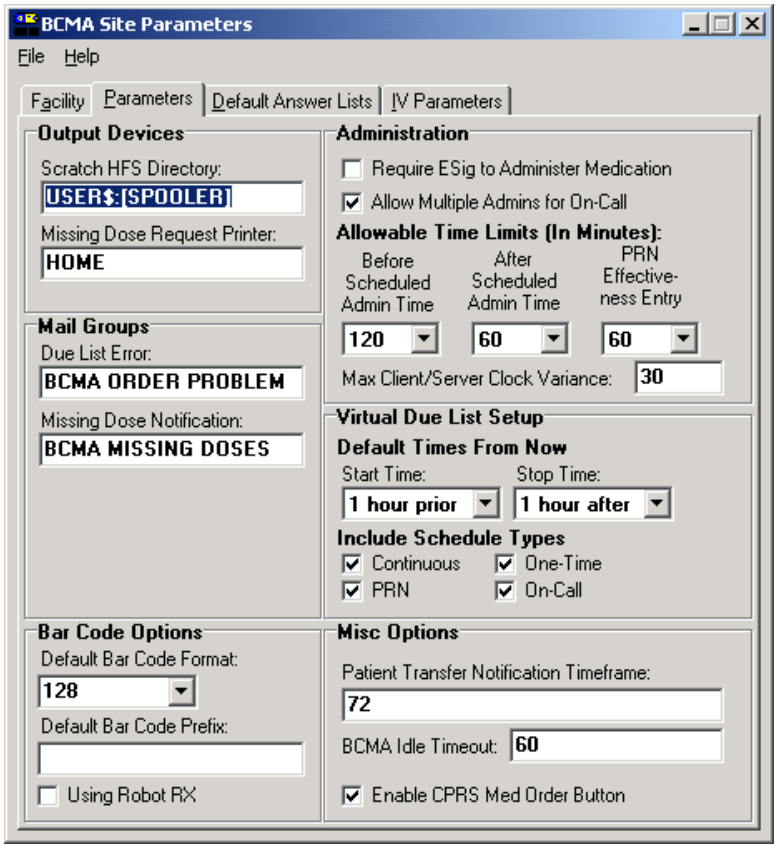
You can define the new BCMA V. 2.0 parameters using the GUI BCMA Site Parameters application.

BCMA V. 2.0 includes three new site parameters: Patient Transfer Notification Timeframe, BCMA Idle Timeout, and Enable CPRS Med Order Button on the Parameters Tab, and the IV Parameters Tab for defining IV Functionality for your division. Each new site parameter is described in this section.

- **Parameters Tab:** The Misc Options area of this Tab includes the Patient Transfer Notification Timeframe field, BCMA Idle Timeout field, and the Enable CPRS Med Order Button check box
- **IV Parameters Tab:** Includes fields for defining IV functionality for your division

Note: After you enter your Access and Verify codes, and division number, using the GUI BCMA Site Parameters application, the BCMA Site Parameters Main Screen displays. An example of the screen is provided below.

Example: BCMA Site Parameters Main Screen with Parameters Tab Selected



New Site Parameters in BCMA V. 2.0 (cont.)

BCMA Idle Timeout

The "BCMA Idle Timeout" site parameter lets you define the number of minutes that an idle BCMA session can stay open. Once the allowable time-out has been reached, BCMA V. 2.0 will close. If the BCMA session displays a prompt, it will *not* time-out until the prompt is answered. The allowable entry for this parameter is 1 to 1440 minutes/day. The default is 30 minutes.

CPRS Med Order Link ("Hot Button")

The "Enable CPRS Med Order Button" site parameter lets you enable or disable the Med Order Button on the BCMA VDL for your division. It provides a link to the Computerized Patient Record System (CPRS) for clinicians to electronically order, document, review, and sign verbal- and phone-type STAT and NOW (One-Time) medication orders that have been administered to patients. This feature is particularly useful in Intensive Care Units (ICU) type environments, as it helps to streamline the workflow in such a busy setting. Clinicians can access this functionality only if they hold the PSB CPRS MED BUTTON security key.

When a clinician clicks the CPRS Med Order Button on the BCMA VDL, medications are then ordered and signed using the BCMA Order Manager and CPRS Order dialog boxes. These orders are then passed to the Inpatient Medications V. 5.0 software application as "nurse-verified" expired orders with a Priority of "Done." A Pharmacist must still verify these order types. The Provider selected during the Ordering process will receive an "alert," requesting their electronic signature on the order.

BCMA V. 2.0 documents these order types as administered to the patient in the BCMA Medication Log Report and the MAH Report. You can also use the Reports Tab in CPRS to verify that these orders were properly documented.

On the Medication Log, the text titled "BCMA/CPRS Interface Entry," displays opposite the order. You can edit these orders using the *Edit Medication Log* [PSB MED LOG EDIT] option in the CHUI version of BCMA V. 2.0.

New Site Parameters in BCMA V. 2.0 (cont.)

Patient Transfer Notification Timeframe

The "Patient Transfer Notification Timeframe" site parameter lets you define the number of hours, before the current system time, that a patient movement must be less than for the movement type (usually a transfer) to display on the BCMA VDL. The allowable entry for this parameter is a minimum value of 2 and a maximum value of 99. The default is 72 hours.

Note: This parameter is defined by division. Individual client settings are not allowed.

IV Functionality

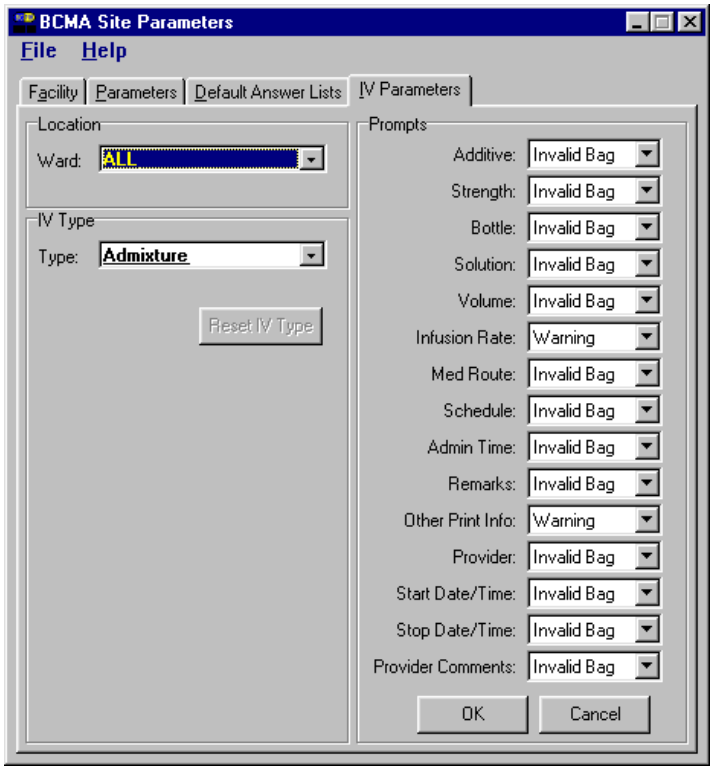
The IV Parameters Tab lets you configure the IV business logic that BCMA V. 2.0 will use when processing an IV medication order that has been edited with the Inpatient Medications V. 5.0 package. You can configure this option using the following hierarchy: Division and Ward.

When BCMA V. 2.0 is first installed, it automatically sets up the recommended default settings for the division and all IV types.

TIP:

Although the default settings for the IV functionality are highly recommended by the BCMA Workgroup, you can still change them for your medical center.

Example: IV Parameters Main Screen



New Site Parameters in BCMA V. 2.0 (cont.)

TIP:

If you later determine that you need to use the default settings for "ALL," simply select the ward in the Ward drop-down list box, then click the **RESET IV TYPE** button. A Warning message will display, informing you that the system will revert to the default Division (ALL) settings.

TIP:

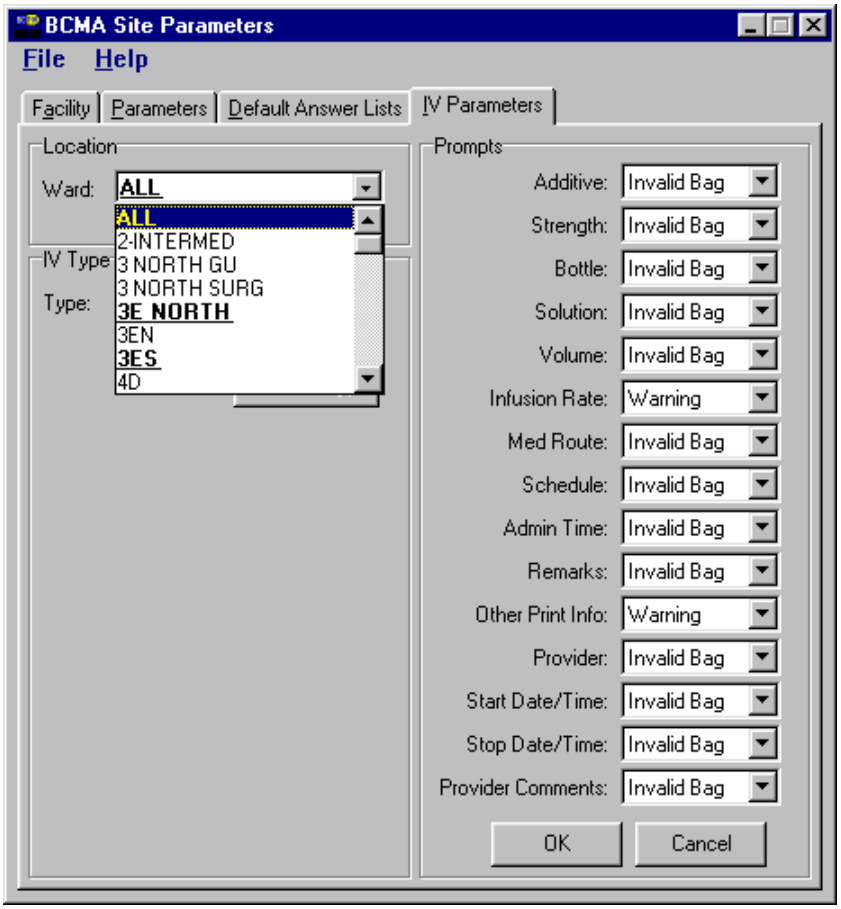
In the Example provided, the Reset IV Type button is located below the Type list box.

IV Functionality (cont.)

➢ Location Area

- **"Ward"** field lets you configure the IV parameter by division (ALL) or by an individual ward. "ALL" is the default setting for a division. This setting includes all wards.
  - ➢ A ward provided in **boldface**, in the list box, indicates that an IV parameter has been set up.
  - ➢ You may change the configuration on an individual ward basis by selecting a ward from the Ward drop-down list box, then making selections from the Prompts section, and then clicking **OK** to accept the changes.

Example: Ward Drop-Down List Box for Location Area



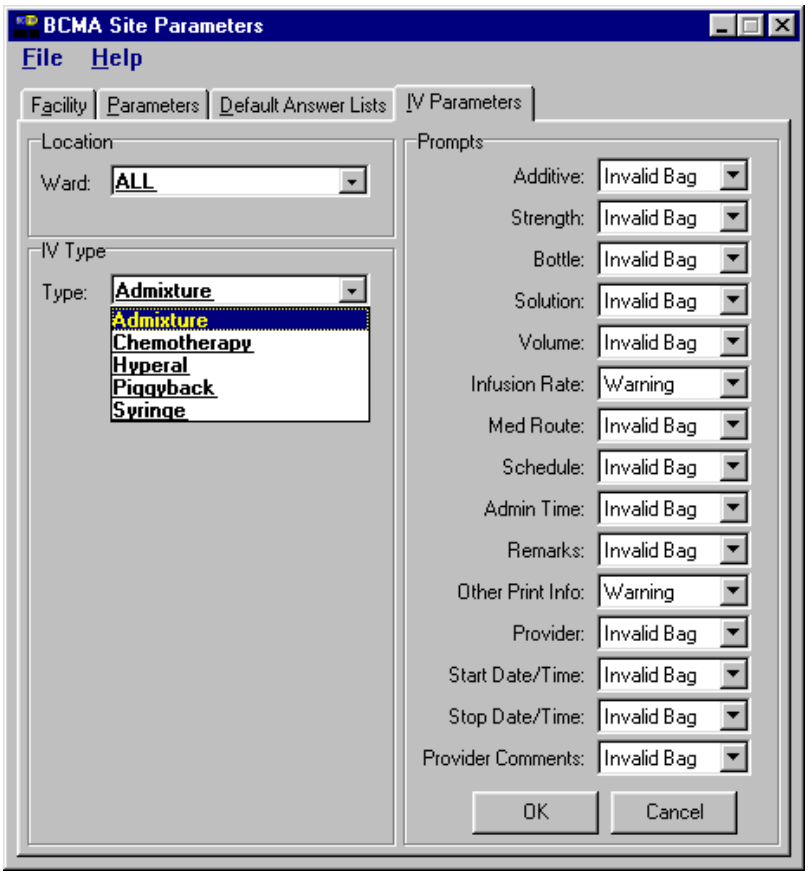
Defining New Site Parameters (cont.)

IV Functionality (cont.)

➢ **IV Type Area**

- **"Type"** field lets you configure the IV parameter by IV Type. They include: Admixture, Chemotherapy, Hyperal, Piggyback, and Syringe.
  - ➢ An IV Type listed in **boldface**, in the list box, is set up for the selected ward.

Example: Type Drop-Down List Box for IV Type Area



TIP:

In the Example provided, the Reset IV Type button is located below the Type list box.

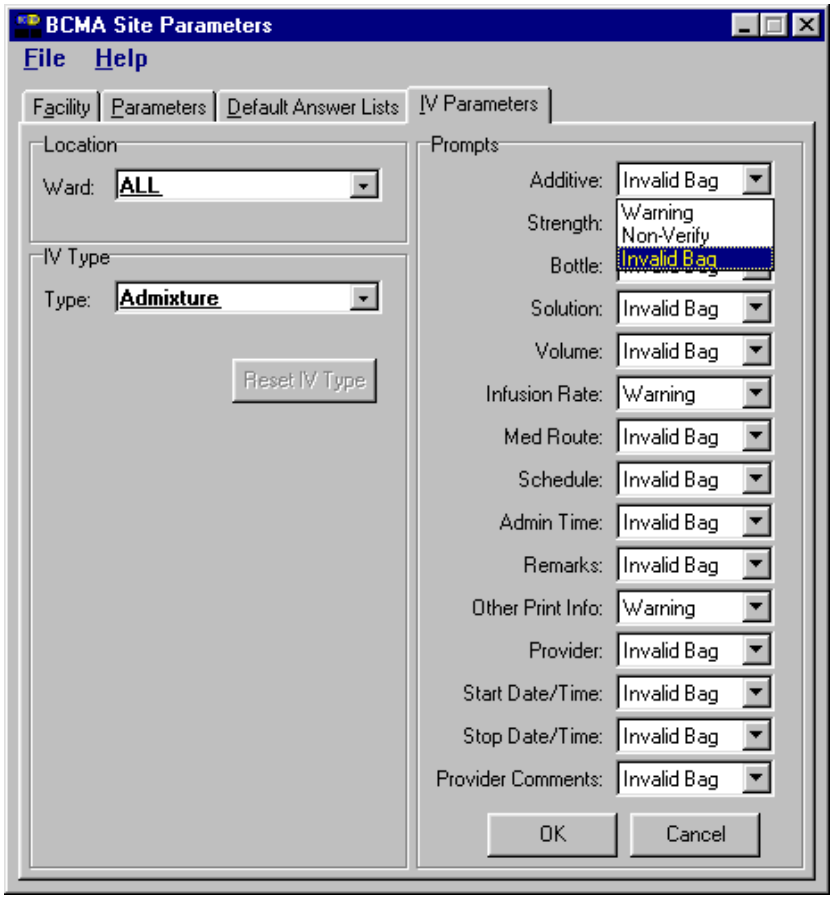
Defining New Site Parameters (cont.)

IV Functionality (cont.)

➢ **Prompts Area**

- Includes fields from the Inpatient Medications V. 5.0 IV Order Entry screen. They include the following: Additive, Strength, Bottle, Solution, Volume, Infusion Rate, Med Route, Schedule, Admin Time, Remarks, Other Print Info, Provider, Start Date/Time, Stop Date/Time, and Provider Comments.
  - ➢ Each field offers a selection of Warning, Non-Verify, and Invalid Bag.

Example: Drop-Down List Box for Additives Field



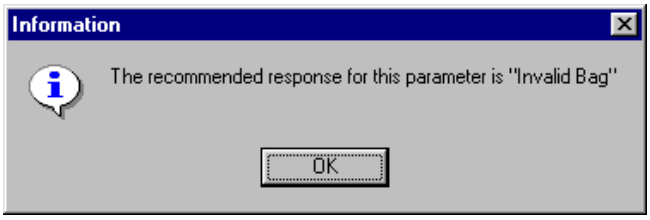
Defining New Site Parameters (cont.)

IV Functionality (cont.)

➢ **Prompts Area (cont.)**

Should you determine that you need to change the Prompts default settings, you will receive an Information message notifying you that your selection is *not* recommended for that particular option.

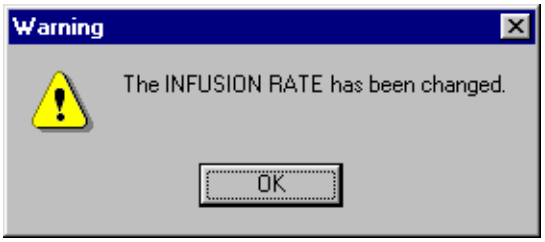
Example: Information Message When Prompts Default Settings Changed



Under the Prompts area, when a field is set to:

- **Warning,** and an order is edited in Inpatient Medications V. 5.0, the IV bags from the old order are carried to the new order and display on the BCMA VDL. When you scan the bar code on an IV bag, a Warning message alerts you about fields that have changed. GUI BCMA would then display the Scan IV dialog box so you can begin infusing the IV bag.

Example: Warning Message That Fields in Inpatient Medications V. 5.0 Changed



- **Non-Verify,** and an order is edited, the IV bags from the old order are carried to the new order and display on the BCMA VDL. When you scan a bar code on an IV bag, NO Warning message displays. The Scan IV dialog box automatically appears so you can begin infusing the IV bag.
- **Invalid Bag,** and an order is edited, the IV bags from the old order do *not* carry to the new order and do *not* display on the BCMA VDL.

Exported Options

BCMA CHUI Menus

BCMA V. 2.0 exports three main menus. They include those listed below, in the CHUI version of BCMA V. 2.0. The options for each menu are listed in this section.

- **Manager Menu:** [PSB MGR] is assigned to managers
- **Pharmacist Menu:** [PSB PHARMACY] is assigned to all Inpatient Pharmacists
- **Nurse Menu:** [PSB NURSE] is assigned to all nurses and other personnel who administer active medication orders

Manager Menu [PSB MGR]

This menu includes the following options:

- Drug File Inquiry
- Medication Administration Menu Nursing
  - Medication Administration Log Report
  - Missed Medications Report
  - Edit Medication Log
  - Ward Administration Times Report
  - Due List Report
  - PRN Effectiveness List Report
  - Enter PRN Effectiveness
  - Manual Medication Entry
  - Medication Administration History (MAH) Report
  - Missing Dose Request
  - Medication Variance Log
  - Drug File Inquiry
- Medication Administration Menu Pharmacy
  - Medication Administration Log Report
  - Missed Medications Report
  - Due List Report
  - Medication Administration History (MAH) Report
  - Missing Dose Request
  - Missing Dose Followup
  - Missing Dose Report
  - Label Print
  - Drug File Inquiry
- Reset User Parameters
- Trouble Shoot Med Log

BCMA CHUI Menus (cont.)

Pharmacy Medication Administration Menu [PSB PHARMACY]

This menu includes the following options:

- Medication Administration Log Report
- Missed Medications Report
- Due List Report
- Medication Administration History (MAH) Report
- Missing Dose Request
- Missing Dose Followup
- Missing Dose Report
- Label Print
- Drug File Inquiry

Nursing Medication Administration Menu [PSB NURSE]

This menu includes the following options:

- Medication Administration Log Report
- Missed Medications Report
- Edit Medication Log
- Ward Administration Times Report
- Due List Report
- PRN Effectiveness List Report
- Enter PRN Effectiveness
- Manual Medication Entry
- Medication Administration History (MAH) Report
- Missing Dose Request
- Medication Variance Log
- Drug File Inquiry

Archiving and Purging

Archive and Purge Capabilities

TIP:

Archive and purge capabilities are *not* available in BCMA V. 2.0.

BCMA V. 2.0 stores detailed information about each inpatient, at your medical center, including medications administered to them and the PRN Effectiveness (when applicable).

- **Average Unit Dose Administration**: Requires about 300 bytes of disk space
- **Average IV Administration:** Requires about 2100 bytes of disk space

Note: Although archive and purge capabilities are *not* currently available in BCMA V. 2.0, when they are, they will be consistent with the CPRS package. BCMA V. 2.0 will offer this feature once it is made available in CPRS.

Defining Mail Groups in BCMA

In BCMA V. 2.0, you can define two "Mail Groups" for notifying Pharmacy, IRM, and other internal staff about errors and Missing Dose Requests. This section describes how you can create mail groups, and the purpose of each group.

Creating Mail Groups for BCMA V. 2.0

Creating mail groups for BCMA V. 2.0 involves using the **V*IST*A** Mail Group *Enter/Edit* [XMUSER] option to set the TYPE field to PUBLIC. Once this task is accomplished, you can then use the Parameters Tab of the GUI BCMA Site Parameters application to define the mail groups that you created.

Mail Group Types in BCMA V. 2.0

This section describes the mail groups that you can define using the Parameters Tab of the GUI BCMA Site Parameters application.

- **Due List Error:** Generates an E-mail message for any medication order that BCMA V. 2.0 *cannot* resolve for the BCMA VDL placement, and sends it to the mail group members. An example might include no administration times entered for a Continuous order.
- **Missing Dose Notification:** Generates an E-mail message for any Missing Dose Request entered using the BCMA V. 2.0 CHUI or GUI menu options. The E-mail is sent to all members of the mail group, specifically Pharmacy, as a "fail safe" even if the designated Missing Dose printer is not functioning.

Security Features

Assigning Menus to Users

Use this section to assign menus to BCMA V. 2.0 CHUI and GUI users, if they have *not* already been assigned.

CHUI Version

Refer to this section for BCMA V. 2.0 CHUI menu assignments.

- **PSB MGR:** assign to a manager
- **PSB PHARMACY:** assign to all Inpatient Pharmacists
- **PSB NURSE:** assign to all nurses and other personnel who administer active medication orders

GUI Version

Refer to this section for BCMA V. 2.0 GUI menu assignments.

- **PSB GUI CONTEXT – USER:** assign to all nurses and other personnel who administer active medication orders

Allocating Security Keys to Users

Refer to this section to allocate the following security keys to appropriate site personnel.

- **PSB MANAGER:** designates the holder as a manager
- **PSB INSTRUCTOR:** designates the holder as a nursing instructor supervising student nurses
- **PSB STUDENT:** designates the holder as a student nurse, requiring that an instructor also sign on to BCMA V. 2.0 at the same time
- **PSB CPRS MED BUTTON:** designates the holder as a nurse who can document administered verbal- and phone-type STAT and NOW (One-Time) orders using the CPRS Med Order Button on the BCMA VDL

Establishing Electronic Signature Codes

You may establish Electronic Signatures Codes using the Kernel *Electronic Signature code Edit* [XUSESIG] option.

Note: For easier access by all users, this option is tied to the Common Options, under the *User's Toolbox* [XUSERTOOLS] submenu.

Developing a Contingency Plan

REMEMBER:

Contingency Planning is a dynamic and ever-changing process.

The National Center for Patient Safety (NCPS) developed BCMA "Healthcare Failure Mode and Effect Analysis (HFMEA™)" Development Documents to assist VA medical centers (facilities) in structuring the analysis process for BCMA Contingency Planning. They include flow diagrams, grids, worksheets, spreadsheets, and the strengths and weaknesses of a few Contingency Plans currently in use. For example, the HFMEA grid focuses on electronic Contingency Planning, since it is anticipated that the vast majority of facilities would use this method.

The documents ("templates") are designed to be a model for the HFMEA Team. They are *not* intended to be all-inclusive, nor can they be replicated from facility to facility, since each location may have unique physical plant and information system issues. The HFMEA Team anticipates that Facility Teams will uncover vulnerabilities unique to their own facility.

After formalized Contingency Planning occurs, additional items may surface, during the year, that your facility can incorporate into a revised plan.

Internal and External Relations

Internal Relations

This section describes options, package-wide variables, and templates within BCMA V. 2.0.

Options

You can invoke ALL options in BCMA V. 2.0 independently.

Package-Wide Variables

BCMA V. 2.0 does *not* include package-wide variables.

Templates

BCMA V. 2.0 does *not* include any templates for Sort, Input, or Print.

External Relations

TIP:

BCMA V. 2.0 requires a Master Build.

BCMA V. 2.0 can only be run in an environment that already has several existing features, such as a standard MUMPS operating system.

It also requires the following Department of Veterans Affairs (VA) software packages (versions listed or higher) — and all current patches. Otherwise, BCMA V. 2.0 will *not* be fully functional for your users.

- Inpatient Medications 5.0
- Kernel 8.0
- MailMan 7.1
- Nursing 4.0
- Order Entry/Results Reporting 3.0
- Pharmacy Data Management 1.0
- RPC Broker (32-bit) 1.1
- Toolkit 7.3
- VA FileMan 22.0

External Relations (cont.)

Callable Routines, Entry Points, and Variables

BCMA V. 2.0 includes two callable routines: PSBIPM and PSBMLHS. Each routine is described in this section, along with the entry points and variables information for each.

- **PSBIPM:** Provides information to Inpatient Medications V. 5.0 for determining the start date for a renewed order.

Example: Entry Points and Variables for PSBIPM

```
   3174     NAME: DBIA3174
 CUSTODIAL PACKAGE: BAR CODE MED ADMIN                        Birmingham
SUBSCRIBING PACKAGE: INPATIENT MEDICATIONS                     Birmingham
        USAGE: Private             ENTERED: AUG 31,2000
       STATUS: Active              EXPIRES:
      DURATION: Till Otherwise Agr  VERSION:
     DESCRIPTION:                          TYPE: Routine
   The entry point EN^PSBIPM is provided by the Bar Code Medication
   Administration (BCMA) package to provide information to Inpatient
   Medications to be used in determining the start date for a renewed order.

    ROUTINE: PSBIPM
   COMPONENT:  $$EN
       Provides Inpatient Medications with the type, date, and status
       of a patient's last BCMA action.
   VARIABLES:  Input     DFN
                The patients internal entry number from the
                PATIENT FILE, 2.

   VARIABLES:  Input     PSBORDX
                The pharmacy order number.
   VARIABLES:  Output    PSBSTUS
                This is the status of the last action.
   VARIABLES:  Output    PSBLAST
                A FileMan date/time. This is the date of the last
                action.
   VARIABLES:  Output    PSBADMDT
                A FileMan date/time. This is the scheduled
                administration time.

       KEYWORDS: PSBIPM
```

External Relations (cont.)

Callable Routines, Entry Points, and Variables (cont.)

Review the information below to learn about the callable routine PSBMLHS and its entry points and related variables.

- **PSBMLHS:** Provides other software packages with the ability to call the BCMA Medication History Report. The report lists medications, that a patient has received, by orderable item.

Example: Entry Points and Variables for PSBMLHS

```
   3459     NAME: PSB MEDICATION HISTORY REPORT
 CUSTODIAL PACKAGE: BAR CODE MED ADMIN                          Birmingham
SUBSCRIBING PACKAGE:
        USAGE: Supported           ENTERED: SEP 25,2001
       STATUS: Active              EXPIRES:
     DURATION: Till Otherwise Agr  VERSION:
    DESCRIPTION:                         TYPE: Routine
  The purpose of this agreement is to provide other packages with the
  ability to call the BCMA Medication History report. It returns a report of
  medications a patient has received by orderable item.

  This DBIA is for BCMA Version 2.0 only.

   ROUTINE: PSBMLHS
  COMPONENT:  HISTORY
  VARIABLES:  Input     RESULTS
               The name of the array that the output is passed in.
  VARIABLES:  Input     DFN
              Patient IEN number.

  VARIABLES:  Input     PSBOI
               Orderable Item number.
      KEYWORDS:  PSB
          BCMA
```

External Relations (cont.)

Database Integration Agreements (DBIAs)

BCMA V. 2.0 has Database Integration Agreements (DBIAs) with the Inpatient Medications, Nursing, Registration, and CPRS packages.

For detailed information about these DBIAs, use the *DBA* [DBA] option and the *Integration Agreement Menu* [DBA IA ISC] in FORUM.

Glossary

Learning BCMA V. 2.0 Lingo

The alphabetical listing, in this section, is designed to familiarize you with the many acronyms and terms used throughout this guide.

Example: Alphabetical Listing of BCMA V. 2.0 Acronyms and Terms

ACRONYM/TERM	DEFINITION
Archive	To transfer files from a computer onto long-term storage.
CHUI	**Ch**aracter-based **U**ser **I**nterface.
Client	An architecture in which one computer can get information from another. The Client is the computer that asks for access to data, software, or services.
CPRS	**C**omputerized **P**atient **R**ecord **S**ystem. A **V***IST***A** software application that allows users to enter patient orders into different packages from a single application. All pending orders that appear in the Unit Dose and IV packages are initially entered through the CPRS package. Clinicians, managers, quality assurance staff, and researchers use this integrated record system.
Data Dictionary	Also called "DD," the dictionary that contains file attributes.
DBIA	**D**ata**b**ase **I**ntegration **A**greement. A formal understanding between two or more application packages which describes how data is shared or how packages interact. This Agreement maintains information between package Developers, allowing the use of internal entry points or other package-specific features.
FileMan	The **V***IST***A** database management system.
GUI	**G**raphical **U**ser **I**nterface. The type of interface chosen for BCMA V. 2.0.
IV	A medication given intravenously (within a vein) to a patient from an IV bag. IV types include Admixture, Chemotherapy, Hyperal, Piggyback, and Syringe.
Journaling	A record of changes made in files and messages transmitted. It is quite useful when recovering previous versions of a file before updates were made, or to reconstruct updates if an updated file gets damaged.
MAH	**M**edication **A**dministration **H**istory. A patient report that lists a clinician's name and initials, and the exact time that an action was taken on an order (in a conventional MAR format). Each order is listed alphabetically by the orderable item. The date column lists three asterisks (***) if a medication was Discontinued.

Glossary

Learning BCMA V. 2.0 Lingo (cont.)

The alphabetical listing, in this section, is designed to familiarize you with the many acronyms and terms used throughout this guide.

Example: Alphabetical Listing of BCMA V. 2.0 Acronyms and Terms

ACRONYM/TERM	DEFINITION
MAR	**M**edication **A**dministration **R**ecord. The traditional, handwritten record used for noting when a patient received a medication. BCMA V. 2.0 replaces this record with an MAH.
NOW Order	A medication order given ASAP to a patient, entered as a One-Time order by Providers and Pharmacists. This order type displays for a fixed length of time on the VDL, as defined by the order Start and Stop Date/Time.
Patient Transfer Notification	A message that displays when a patient's record is opened or the Unit Dose or IVP/IVPB Medication Tab is viewed for the first time. This message indicates that the patient has had a movement type (usually a transfer) within the site-definable parameter, and the last action for the medication occurred before the movement, but still within the defined timeframe.
PSB CPRS MED BUTTON	The name of the security "key" that must be assigned to nurses who document verbal- and phone-type STAT and NOW (One-Time) medication orders using the CPRS Med Order Button on the BCMA VDL.
PSB INSTRUCTOR	The name of the security "key" that must be assigned to nursing instructors, supervising nursing students, so they can access user options within BCMA V. 2.0.
PSB MANAGER	The name of the security "key" that must be assigned to managers so they can access the PSB Manager options within BCMA V. 2.0.
PSB STUDENT	The name of the security "key" that must be assigned to student nurses, being supervised by nursing instructors, so they can access user options within BCMA V. 2.0. This key requires that a nursing instructor sign on to BCMA V. 2.0.
Purge	To delete a set of data, and all references to the data.
RPC	**R**emote **P**rocedure **C**all. A procedure stored on the **V***IST***A** Server, which is executed to return data to the Client.
RPC Broker	A Client/Server System within the VA's Veterans Health Information Systems and Technology Architecture (**V***IST***A**) environment. It enables client applications to communicate and exchange data with M Servers.

Glossary

Learning BCMA V. 2.0 Lingo (cont.)

The alphabetical listing, in this section, is designed to familiarize you with the many acronyms and terms used throughout this guide.

Example: Alphabetical Listing of BCMA V. 2.0 Acronyms and Terms

ACRONYM/TERM	DEFINITION
Security Keys	Used to access specific options within BCMA V. 2.0 that are otherwise "locked" without the security key. Only users designated as "Holders" may access these options.
Server	An architecture in which one computer can get information from another. The Server, which can be anything from a personal computer to a mainframe, supplies the requested data or services to the Client.
STAT Order	A medication order given immediately to a patient, entered as a One-Time order by Providers and Pharmacists. This order type displays for a fixed length of time on the VDL, as defined by the order Start and Stop Date/Time.
VDL	**V**irtual **D**ue **L**ist. An on-line "list" used by clinicians when administering **active** medication orders (i.e., Unit Dose, IV Push, IV Piggyback, and large-volume IVs) to a patient. This is the Main Screen in BCMA V. 2.0. **Note:** This is called BCMA VDL in this guide to eliminate confusion with the **V***IST***A** Documentation Library (VDL) also mentioned in this guide.
VISTA	**V**eterans Health **I**nformation **S**ystems and **T**echnology **A**rchitecture.
Ward Stock	Unit Dose and IV medications that are "stocked" on an ongoing basis on wards and patient care areas. They are packaged in a ready-to-use form or compounded by the medication administrator.

Appendix A: Processing of Schedule Information

How BCMA Processes Schedule Information

This section describes how BCMA V. 2.0 processes Schedule information from Inpatient Medications V. 5.0, and how it determines when to display a Continuous medication order on the VDL. Keep in mind that BCMA displays medication orders on the VDL between the order Start and Stop Date and Time.

The information provided below defines term used in this section:

- **Admin Time:** The ADMIN TIMES field (#41) of the UNIT DOSE multiple (#62) of the PHARMACY PATIENT file (#55), and the ADMINISTRATION TIMES field (#.12) of the IV multiple (#100) of the PHARMACY PATIENT file (#55).
- **Frequency:** The FREQUENCY field (#42) of the UNIT DOSE multiple (#62) of the PHARMACY PATIENT file (#55), and the SCHEDULE INTERVAL field (#.17) of the IV multiple (#100) of the PHARMACY PATIENT file (#55).
- **Schedule:** The SCHEDULE field (#26) of the UNIT DOSE multiple (#62) of the PHARMACY PATIENT file (#55), and the SCHEDULE field (#.09) of the IV multiple (#100) of the PHARMACY PATIENT file (#55).
- **Schedule Type:** The SCHEDULE TYPE field (#7) of the UNIT DOSE multiple (#62) of the PHARMACY PATIENT file (#55). For IV orders, it refers to the pseudo-type determined by Inpatient Medications that is sent to BCMA.

Steps for Processing Schedule Information

This section describes the steps for processing schedule information from Inpatient Medications to BCMA.

1. BCMA checks the Inpatient Medications order for a Schedule Type of "Continuous."
   - If a Schedule Type other than "Continuous" is listed, BCMA quits processing the order, and proceeds to the correct processing method for that order's Schedule Type.

Steps for Processing Schedule Information (cont.)

2 BCMA verifies information provided in the Schedule of the Inpatient Medications order.

- If the Schedule is blank, BCMA quits processing the order and sends a Due List Error Notification message. (**Note:** A blank indicates that no Schedule was specified.)
- If the Schedule lists a Day of the Week (i.e., MO-WE@1200), BCMA checks the Admin Time(s) for the correct two- or four-digit format (i.e., 12-14, 1200, 1400).
  - If an Admin Time is listed, BCMA displays the order on the VDL, on specified days, using the Admin Time.
  - If no Admin Time is listed, BCMA quits processing the order and sends a Due List Error Notification message.
- If the Schedule lists an Admin Time (i.e., 12-14, 1200, 1400), BCMA checks the Admin Time in the Inpatient Medications order.
  - If the Admin Time is blank, BCMA quits processing the order and sends a Due List Error Notification message.
  - If an Admin Time is listed, BCMA verifies for the correct two- or four-digit format (i.e., 12-14, 1200, 1400). If **valid**, BCMA displays the order on the VDL every day using the Admin Time provided. If **invalid**, BCMA quits processing the order and sends a Due List Error Notification message.

3 BCMA verifies information provided in the Frequency of the Inpatient Medications order. **(Note:** The Frequency is the amount of time between medication administrations.)

- If the Frequency is blank, contains a letter other than "O" (the letter), or lists a Frequency less than one minute, BCMA quits processing the order and sends a Due List Error Notification message. (**Note:** A blank indicates that no Frequency was specified.)
- If the Frequency lists "O" (the letter), BCMA converts the Frequency to 1440 minutes (one day) and proceeds to Step #4.

Steps for Processing Schedule Information (cont.)

4 BCMA verifies whether the order contains an Odd Schedule by determining that data in the order Frequency is not divisible by 1440 minutes (one day), and that 1440 minutes is not divisible by the data in the order Frequency. See the examples provided below.

- If the order contains an Odd Schedule and times in the Admin Time, BCMA quits processing the order and sends a Due List Error Notification message.
- If the order contains an Odd Schedule, but no times in the Admin Time, BCMA displays the medication order on the VDL using the Frequency and order Start Date/Time provided by Inpatient Medications to calculate the Admin Times.
- If the order does *not* contain an Odd Schedule and no times are listed in the Admin Time, BCMA displays the medication order on the VDL using the Frequency and order Start Date/Time provided by Inpatient Medications to calculate the Admin Times.
- If the order does *not* contain an Odd Schedule, but times are listed in the Admin Time, BCMA verifies the Frequency listed in the order.
  - If the Frequency is *less than* 1440 minutes (or one day), BCMA displays the medication order on the VDL every day, based on the Admin Times provided in the order.
  - If the Frequency is *greater than* 1440 minutes (or one day), BCMA uses the Frequency information from Inpatient Medications to determine which day to display the medication order on the VDL, based on the Admin Time provided in the order.

Appendix A: Processing of Schedule Information

Steps for Processing Schedule Information (cont.)

This section provides examples showing Schedules Types that are processed as Odd Schedules and those that are not.

Note: For an Odd Schedule to occur, both statements for a Schedule Type must be False.

Examples of Odd Schedules

Schedule Type: Q5H (300 minutes)

- 300 minutes divided by 1440 minutes = fraction, not a whole number = False
- 1440 divided by 300 minutes = 4.8 (fraction, not a whole number) = False

Schedule Type: Q3XM (13440 minutes)

- 13440 minutes divided by 1440 minutes = 9.3 (fraction, not a whole number) = False
- 1440 divided by 13440 minutes = fraction, not a whole number = False

Examples of Schedules That Are Not Odd Schedules

Schedule Type: Q2H (120 minutes)

- 120 minutes divided by 1440 minutes = 8.3 (fraction, not a whole number) = False
- 1440 minutes divided by 120 = 12 (whole number) = True

Schedule Type: QOD (2880 minutes)

- 2880 minutes divided by 1440 minutes = 2 (whole number) = True
- 1440 minutes divided by 2880 = 0.5 (fraction, not a whole number) = False